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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/786,842	02/25/2004	Michael G. Reynolds	GP-303485	2934
<div>7590      12/20/2006</div> <p>LESLIE C. HODGES General Motors Corporation Legal Staff, Mail Code 482-C23-B21 P.O. Box 300 Detroit, MI 48265-3000</p>			<div>EXAMINER</div> <p>ROJAS, BERNARD</p> <div>ART UNIT      PAPER NUMBER</div> <p>2832</p>	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		12/20/2006	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/786,842

Applicant(s)

REYNOLDS ET AL.

Examiner

Bernard Rojas

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 04/17/2006.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-15 and 17-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10, 12-15, 17, 18 and 20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments filed 09/26/2006 have been fully considered but they are not persuasive. Applicant states that Suzuki et al. [US 6,960,847] fails to disclose claim 1, as amended, "at least two axially spaced permanent magnets mounted on an exterior of an axially extending steel magnetic core" since the magnets [32, 33] of Suzuki et al. are mounted on the ends of the yoke [31]. The exterior of the core includes the end, since they are exterior to the interior [the bore] of the core, therefore Suzuki et al. discloses mounting the magnets axially on the exterior of the core.

### ***Claim Rejections - 35 USC § 103***

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-15 and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. [US 6,960,847] in view of Hirabayashi et al. [US 5,434,549].

Claim 1, Suzuki et al. discloses a magnetic force generator comprising a shell [11] internally defining an armature chamber having an axis [along 24]; at least two circumferential electric coils [12 and 13] spaced axially within the chamber; an armature [2] supported in the chamber for reciprocation on the axis, the armature including at least two axially spaced permanent magnets [figure 4, 32 and 33] mounted on an exterior of an axially extending steel magnetic core [24, 31 figure 4]; the permanent magnets extending axially, inwardly adjacent and in general alignment with the electric coils [figures 1 and 5]; the magnets having radially extending flux lines passing through the coils [figure 5]; and controlled energizing of the coils being operative on the permanent magnets to reciprocate the armature axially in a controlled manner relative to the shell [abs].

Suzuki et al. fails to teach resilient members nominally centering the armature in the chamber.

Hirabayashi et al. discloses a magnetic force generator comprising a shell [1] internally defining an armature chamber having an axis [along 25]; at least two circumferential electric coils [2A, 2B, 2C] spaced axially within the chamber; an armature [3] supported in the chamber for reciprocation on the axis, the armature

including at least two axially spaced permanent magnets [5A, 5B] mounted on an axially extending non-magnetic tube [figure 1] and resilient members [29] nominally centering the armature in the chamber.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add the resilient members of Hirabayashi et al. to the device of Suzuki et al. in order to nominally centering the armature in the chamber when no magnetic force is applied.

Claim 2, Suzuki et al. discloses a magnetic force generator as in claim 1 wherein the magnets are cylindrical [figure 4] and the core supports the magnets over approximately their axial length [figure 4].

Claim 3, Hirabayashi et al. teaches that the resilient members are compression springs [col. 15 lines 65-66].

Claims 4 and 14, Suzuki et al. discloses the shell being part of a housing including ends [3 and 4] closing the chamber, but fails to teach that the ends are made of non-magnetic material. It would have been obvious to one of ordinary skill in the art at the time the invention was made to construct the ends of non-magnetic material in order to direct the magnetic flux line between the coil and the magnet as shown in figure 5.

Claim 5, Suzuki et al. discloses a magnetic force generator as in claim 1 wherein the shell is formed of material that carries magnetic flux [col. 4 lines 55-60].

Claim 6, Suzuki et al. discloses the claimed invention except for the use of a carbon steel shell. It would have been obvious to one of ordinary skill in the art at the

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time the invention was made to use carbon steel over the steel shell disclosed by Suzuki in order to obtain the benefit of increased shell strength [col. 4 lines 55-60].

Claim 7 and 17, Suzuki et al. discloses the claimed invention except for the armature having end caps of non-magnetic material. It would have been obvious to one of ordinary skill in the art at the time the invention was made to construct the armature with non-magnetic end caps in order to direct the magnetic flux line between the coil and the magnet as shown in figure 5.

Claims 8 and 9, Suzuki et al. as modified discloses the claimed invention except for the composition of the permanent magnets. It would have been obvious to one of ordinary skill in the art at the time the invention was made to alter the composition of the permanent magnets in order to change the magnetic properties of the device, alter the armature response time, adjust the armature weight or the cost of manufacturing [Hirabayashi et al. teaches using rare earth permanent magnets col. 15 line 68 to col. 16 line 3 and col. 14 lines 64-70].

Claim 10, Suzuki et al. discloses a magnetic force generator as in claim 1 wherein the magnets are radially magnetized in opposite directions [figure 4].

Claim 11, Suzuki et al. discloses a magnetic force generator as in claim 1 wherein the coils are wound in opposite directions [figure 4].

Claim 12, Suzuki et al. discloses a magnetic force generator as in claim 1 wherein the axial length of the coils is generally similar to the axial length of the magnets [figure 5].

Claim 13, Suzuki et al. discloses a magnetic force generator comprising a shell [11] internally defining an armature chamber having an axis [along 24]; at least two circumferential electric coils [12 and 13] spaced axially and fixed within the chamber; an armature [2] supported in the chamber for reciprocation on the axis, the armature including at least two axially spaced permanent magnets [figure 4, 32 and 33] mounted on an exterior of an axially extending magnetic tube [24, 31 figure 1];

the permanent magnets extending axially, inwardly adjacent and in general alignment with the electric coils [figures 1 and 5]; the magnets having radially extending flux lines passing through the coils [figure 5]; and controlled energizing of the coils being operative on the permanent magnets to reciprocate the armature axially in a controlled manner relative to the shell [abs].

Suzuki et al. fails to teach resilient members nominally centering the armature in the chamber.

Hirabayashi et al. discloses a magnetic force generator comprising a shell [1] internally defining an armature chamber having an axis [along 25]; at least two circumferential electric coils [2A, 2B, 2C] spaced axially within the chamber; an armature [3] supported in the chamber for reciprocation on the axis, the armature including at least two axially spaced permanent magnets [5A, 5B] mounted on an axially extending non-magnetic tube [figure 1] and resilient members [29] nominally centering the armature in the chamber.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add the resilient members of Hirabayashi et al. to the device of

Suzuki et al. in order to nominally centering the armature in the chamber when no magnetic force is applied.

Claim 15, Suzuki et al. discloses a magnetic force generator as in claim 13 wherein the shell is formed of material that carries magnetic flux [col. 4 lines 55-60].

Claim 18, Suzuki et al. a magnetic force generator as in claim 13 wherein the magnets are radially magnetized in opposite directions [figure 4].

Claim 19, Suzuki et al. discloses a magnetic force generator as in claim 13 wherein the coils are wound in opposite directions [figure 4].

Claim 20, Suzuki et al. discloses a magnetic force generator as in claim 13 wherein the axial length of the coils is generally similar to the axial length of the magnets [figure 4] and the core supports the magnets over approximately their axial length [figure 4].

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the




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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard Rojas whose telephone number is (571) 272-1998. The examiner can normally be reached on M-F 8-4:00), every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Elvin G. Enad can be reached on (571) 272-1990. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
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SUPERVISORY PATENT EXAMINER  
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